ROYAL BOTANIC GARDENS, KEW.

BULLETIN

OF

MISCELLANEOUS INFORMATION.

Nos. 157-168. 1900.

I.—BOTANICAL MUSEUMS IN FRANCE.

During the Autumn of 1897, Mr. J. M. Hillier, Assistant in the Museums of the Royal Botanic Gardens, was instructed to visit the principal botanical museums in Belgium and Holland, with the view of noting deficiences in the Kew Museums and of observing the general arrangements of the collections and the methods adopted in mounting and preserving museum objects [*Kew Bulletin*, April and May, 1898]. As a result of this visit, many interesting and valuable products have been obtained and added to the museums, and useful hints gathered on practical museum work. In view of the efforts made by Kew in developing the natural resources of our W. African possessions, and of French enterprise in that portion of the African Continent, Mr. Hillier was further instructed, in July of 1899, to proceed to France, for the purpose of studying, more particularly, the vegetable products of French Colonial possessions in a few of the more important museum collections. The Museum of the French Colonies in Marseilles, in particular, has afforded much desirable information. The following report has been furnished by Mr. Hillier.

Jardin des Plantes, Rouen.

The gardens are situated on the outskirts of the city. The plants are classified according to the system of A. Brongniart, and are for the use of the School of Botany, at Rouen. There is no museum connected with the gardens.

Museum of Natural History, Rouen.

This collection is in a new building, which, at the time of my visit, was not yet opened to the public, as the specimens were in

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course of arrangement. The director, Prof. Pennetier, readily conducted me through the museum. The botanical section is not a feature of the establishment, but the director intends to develop this branch in course of time. When arranged the museum will be very useful and instructive, as it contains many attractive exhibits. Amongst the botanical specimens I failed to find anything to call for special mention in connection with the Museums of the Royal Botanic Gardens. Adjoining this museum, but distinct from it, is an ancient building, in use as a Museum of Archæology.

Commercial Museum, Rouen.

This museum consists of a very interesting collection, which must be of great value to the commerce of the City of Rouen. Fibres, fabrics, together with French and Algerian timbers, form the bulk of the specimens. Cotton is particularly well represented, a retrospective series of printed fabrics of this product, together with some beautiful printing blocks in wood and metal, being of special interest. English, Canadian, and American cotton materials, and English lace, as imported into Mexico, Cochin China, &c., also English and American fabrics imported into Canada, are here represented, with full details as to price, suggestions as to colour and design, and probabilities of trade. Similar examples of English jute fabrics imported into Turkey, with trade details, are also in the collection. Many samples illustrating the Rhea industry, and various materials employed for brush-making, are also to be seen. In addition to the above is a large number of portfolios filled with patterns of various fabrics, and there is also a small library attached to the museum.

Jardin des Plantes, Paris.

The botanical section of the Museum of Natural History in these gardens is scientific rather than economic. The collection, consisting chiefly of fruits arranged under their respective natural orders, in lofty upright and table cases, is employed for teaching purposes. Several special cases contain good models illustrating the life history of the cocoa-nut and coco-de-mer (*Lodoicea sechellarum*, Lab.), and also models of the "Cambare" of Java (*Amorphophallus campanulatus*, Bl.) and a model of the upper portion of the stem of *Cycas circinalis*, L., bearing a cone and leaves. There are also other interesting models, of good workmanship, calling for special mention, such, for instance, as the large series of gourds and fungi, four special cases being utilised for the display of the latter, many of the illustrations being in section. Another group of models well displayed and admirable for teaching purposes consists of a considerable collection of exotic fruits together with the foliage, the work of M. de Robillard d'Argentelle, prepared in Bourbon between the years 1802 and 1826, the majority of them being in excellent preservation. Many paintings of economic plants are arranged along the tops of the cases.

An extensive paleontological series of specimens is arranged in separate cases in the bays of the Museum. The entrance hall to the collections contains trunks of tree ferns, palms, &c., and a

fine gnarled base of the stem of *Corylus Colurna*, L., the wood of which is used for turning fancy articles and for cabinet work. Notes were taken of various specimens required for Kew, and also of a method of mounting specimens somewhat different from that followed at Kew.

In another part of the gardens in an old and somewhat dilapidated building is a large and varied collection of economic specimens which formed part of the old Natural History Museum of Paris. This collection contains many products of considerable age and interest, having been collected during the reign of Louis XIII.

M. Cornu and M. Bureau afforded me every facility for studying the collections under their charge, with the result that I was enabled to take notes of many very interesting products. M. Cornu informed me that it is intended to erect as soon as possible a building to receive this collection, which will be kept distinct from the arranged museum of the gardens. In consideration of the importance of the trade in so-called African mahogany, it may be well to record the fact that M. Cornu has at the present time under cultivation in the gardens plants of the Gabon mahogany of commerce, which so far he has been enabled to identify as a species of *Bursera*.

L'École Supérieure de Pharmacie, Paris.

In addition to suggesting that I should visit this institution, M. Cornu very kindly accompanied me thither, and after personally introducing me and explaining my mission to M. Planchon, the director, assisted me with details of interest bearing upon the collections.

The Museum consists of several large and separate collections of drugs. One series is arranged according to the classification of Durand, each individual specimen bearing a number which corresponds to the Herbarium collection. Another collection is arranged geographically, and a further collection consists of specimens classified according to the parts of the plants employed under the heads of stems, bark, roots, &c.

The original collection made by Guibourt is preserved in the Museum. The specimens in the upright cases are for the most part contained in stoppered jars, very few being in fluid; those in the table cases are placed in glass trays on stands, affording every facility for close examination by the students. M. Planchon explained the arrangement of the Museum, and readily gave me permission to examine the collections. Many of the specimens are unique and of historical interest, and, generally speaking, the Museum afforded much valuable information. Under the above-described system of arrangement, the Museum contains many specimens in duplicate, which is not altogether advisable in a limited space, but it is only just to record the fact that each specimen is distinctly labelled and in excellent order.

Jardin des Plantes, Dijon.

This is a very pretty garden, and evidently very old. It contains many good-sized trees and shrubs, and a fairly large collection of economic plants arranged according to natural orders.

At the entrance to the garden is a Museum of Natural History containing many interesting specimens, but only a few illustrations of a botanical character. The collection is in fairly good order, but does not appear to have been added to for some time. Adjoining the museum is a small herbarium.

Jardin Botanique, Lyons.

This is by far the most beautiful garden that I visited. It is situated in the Parc de la Tête-d'Or, which covers 280 acres, and contains a large collection of economic plants, scientifically arranged and distinctly labelled. Many exotic plants are sunk in pots in the beds, and aquatics are grown in shallow cement pans sunk in the ground. The houses contain many striking and interesting plants, those of economic value bear cast iron enamelled labels illustrating their geographical distribution; examples of these labels are preserved in the Kew Museum for reference. A group of plants, consisting chiefly of Cacti, is grown in a permanent bed in the open. It is arranged in the form of concrete tiers, the whole being enclosed in a span-shaped iron frame covered with wire netting of small mesh. The following is a list of the larger plants established in the palm house :—

Caryota rumphiana, Mart.
Caryota excelsa, Hort. ex. H. Wendl.
Rhopalostylis Baueri, W. & D.
Rhopalostylis sapida, W. & D.
Livistona olivæformis, Mart.
Livistona australis, Mart.
Arenga manillensis, Wendl.
Cocos Datil, Drude & Griseb.
Acanthophœnix rubra, Wendl.
Astrocaryum rostratum, Hook. f.
Acanthorhiza Warscewiczii, Wendl.
Gaussia Ghiesbreghti, Wendl.
Dracœna fragrans, Ker-Gawl.
Strelitzia Augusta, Thb.
Pandanus Candelabrum, Beauv.

There is no museum in the gardens.

Private collection of Economic Botany, Lyons.

It occurred to me that I might obtain some information upon the vegetable dyes employed in the silk trade at Lyons from M. Cesar Chantre, a resident in that city, and an ardent economic botanist, who has contributed, at various times, many valuable products to the Kew Museums. I was surprised to find that, notwithstanding the rank of Lyons as a commercial centre, it does not possess a museum of any importance. M. Chantre very kindly furnished me with the list of silk dyes which is given below, and also invited me to view his private collections of drugs and other products. In the course of business, M. Chantre has recently resided for a considerable period in the East, and during a six months sojourn in Shanghai, purchased, in the markets, a splendid collection of Chinese drugs, which he allowed me to go through

and take notes upon ; he also gave me several specimens for the Kew Museums.

Vegetable Dyes employed in the Silk Industry, Lyons.

Gambier (*Uncaria Gambier*, Roxb.) This is the principal vegetable dye in use.
Sumac (*Rhus Coriaria*, L.).
Turkey Nut Galls (*Quercus lusitanica*, var. *infectoria*, A. DC.).
Chinese Galls, Japanese Galls } (*Rhus semialata*, Murr.).
Safflower (*Carthamus tinctorius*, L.).
Turmeric (*Curcuma longa*, L.).
Orchella Weeds (*Roccella* spp.).
Indigo (*Indigofera tinctoria*, L., and *I. Anil*, L.).

In addition to the above very large quantities of extract from Sweet Chestnut bark (*Castanea sativa*, Mill.) are employed.

Botanic Garden, Marseilles.

This garden is very pleasantly situated in the Borély Park, on the outskirts of the city, and in close proximity to the sea. It is approached from the city by fine roads planted with avenues of Oriental Planes. The classified collection of plants is not very large, and is for the use of a School of Botany in the garden. A Chateau close by, in the Park proper, is utilised as a museum, the specimens consisting chiefly of Archæological antiquities and a few Ethnological objects, but nothing of botanical interest.

Colonial Museum, Marseilles.

This very important institution is under the control of the Minister of the Colonies, and is situated in the immediate vicinity of the Docks. The products are arranged geographically in wall and table cases made of oak. Each specimen is very distinctly labelled with native and scientific names, and, in many instances, notes on its properties and uses are added. Through the courtesy of the director, M. E. Heckel, I was enabled to go thoroughly through the museum, which I found to be very rich in the products of the French Colonies. I took notes of a large number of products unrepresented at Kew, and also gained much valuable information with regard to the native names and uses to add to specimens already in the Kew Museums. A collection of Herbarium specimens is contained in drawers under the table cases. M. Heckel readily agreed to my suggestion to exchange duplicates.

The Docks, Marseilles.

Great activity prevails everywhere in the neighbourhood of the docks, and the visitor cannot fail to realize the importance of Marseilles as a port. Enormous quantities of merchandise are to be seen everywhere. The following notes refer to those vegetable products which I was able to identify.

It was striking to observe the quantities of copra (*Cocos nucifera*, L.) in heaps and sacks, shipped chiefly from Singapore and Mozambique. This port is the centre of the ground nut (*Arachis hypogæa*, L.) industry. I visited two large sheds containing enormous heaps of ground nuts in the husk. Workmen were engaged in sifting and weighing this product into small bags. The sieves are from three to four feet in diameter, suspended from a wooden tripod, wooden shovels and esparto baskets being employed in the work. Close by I observed large quantities of oil cake, square and circular in shape, which I found, upon enquiry, to be the residue of the ground nut after the extraction of the oil. I also noticed on several occasions oil cake of various shapes and colour being carted to the docks for export. In addition to copra and ground nut were other oil seeds, including rape, mustard, linseed, and castor oil. Many miscellaneous products may be added to the list, such as rice in sacks, wheat which was being unshipped from Bombay, liquorice root in oblong cumbersome bales wrapped in matting made of *Tilia* bast, large casks of olive oil from Tunis, bales of cotton, sandalwood chips in sacks, long circular packages of Chinese matting, bales of Chinese coir, crin vegetal (green and black), bales of jute, esparto, and orchella weed, the latter packed in matting of palm leaf, firmly held together with bands of iron hooping. I also observed upon one occasion what appeared to be teazled esparto being carted in the city, maize, haricot beans, coffee from San Salvador and Mozambique, and very many casks of wine.

There were many cases of castor oil, sacks of peas (*Pisum sativum*, L.), bags of briar root for the manufacture of tobacco pipes, and very neatly and closely repacked bales of liquorice root and bales of virgin cork awaiting export.

Large quantities of timber stacked in sheds similar to those of the London Docks, but with less care and uniformity, were also noted. I was enabled to identify with a fair amount of certainty the following :—Fine butts and burrs of walnut from Batoum and Constantinople, teak of various dimensions derived chiefly from Batavia, boxwood in 6, 7, and 8 feet lengths and about 10 inches in diameter from Batoum, Macassar, and Mozambique, ebony very irregular in shape and varying in length from about 6 to 15 feet, large baulks of cedar from Brazil, probably *Cedrela fissilis*, Vell., mahogany from Dahomey, this, I was informed by M. Cornu, of the Jardin des Plantes, Paris, is derived from a species of *Bursera*, planks apparently of a coniferous wood stencilled "Saigon usine," a light-coloured wood shipped from Hull which I took to be ash, and very large quantities of oak staves for casks. In addition to the foregoing, I noticed on the quays large quantities of deals and 7 or 8 feet lengths of whole trunks of a pine of about 1 foot in diameter, which are probably pit props used in mining.

Miscellaneous Notes.

In Paris, Lyons, and Marseilles, Ground Nuts, the pods of *Arachis hypogæa*, L., are commonly hawked about the streets under the name of Pistacios. Pistachio Nut is the common

name for the fruit of *Pistacia vera*, L., a small tree of Western Asia and the Levant.

In many instances, at Lyons and Marseilles, I observed semi-circular tubs at the entrance to grocers shops, containing ripe Olives (black) preserved in oil, and the green unripe fruits pickled in brine. I also noticed, in one instance, at Lyons, roasted Barley exposed for sale, which, upon enquiry, I was given to understand is employed by the poorer classes as a substitute for coffee or for mixing with it. It may be of interest to record some of the uses to which Esparto (*Stipa tenacissima*, L.) is put, particularly in the neighbourhood of Marseilles.

Strong, serviceable baskets of this material are very generally used on the quays for unloading charcoal, coal, and other substances, similar baskets are also employed on buildings for hoisting stone, bricks, &c., they are also carried by street scavengers for clearing up rubbish with the assistance of a small broom formed of the twigs of *Tamarix gallica*, L. Stout ropes of two or three inches in diameter, formed of this grass, are in common use in the Docks for mooring vessels to the quays. Peaches and Apricots were very cheap, and in one instance, at Marseilles, I saw a fine basket of ripe Mangoes exposed for sale ; they were stated to come from Ceylon.

In the flower markets at Marseilles plants and cut flowers were in great variety, pot plants from Mignonette to Tree Ferns and Cycads could be obtained at a very cheap rate. In one of the open markets in this city Garlic (all roped) was in great abundance, and it was quite a common occurrence to meet an individual coming from the market with a rope or two of Garlic thrown over the shoulder, carrying a beautifully green bushy plant of Sweet Basil (*Ocimum Basilicum*, L.) under the arm. This plant has aromatic properties, and is in general use as a flavouring agent and also for decorative purposes, and may be bought for about $2\frac{1}{2}$ pence.

Large quantities of fresh *Tilia* flowers, in baskets and sacks, were exposed for sale in the markets and shops, an infusion of them is very generally drank as an antiperiodic after meals. *Tilia europeea*, L., *T. argentea*, Desf., and *T. pedunculatis*, Delile, are indiscriminately used for this purpose. I also noticed that Walnut leaves (*Juglans regia*, L.) were in quantity. An infusion of them is employed as a popular remedy for scrofula. Among other vegetable products noted were Mallow plants and flowers. These have mucilaginous properties, and are used as pot-herbs, and, in medicine, as emollients. Fruiting spikes of a *Plantago* were also in abundance. The seeds are extremely mucilaginous and are valued for their demulcent properties. Rose petals and Orange leaves are also to be found in the markets, the latter are employed medicinally in infusion, or as a distillate, as a substitute for Orange flowers.

On several occasions I noticed, in Marseilles, women plaiting Esparto into bands about 3 inches wide. It is evidently used in this form for making baskets. I also observed a large quantity of these bands in one of the Dock warehouses of the city.

J. M. Hillier.

II.—MADAR.

(*Calotropis gigantea*, R. Br.)

With Plate.

Calotropis gigantea and *C. procera* are easily distinguished though, from a practical point of view, their properties are identical. Both flowered under cultivation simultaneously at Kew, and are figured in the Botanical Magazine for 1886 (tt. 6862 and 6859). The former figure is reproduced to illustrate this article.

C. gigantea is a much larger coarser plant than *C. procera*. Both are widely spread in India. But outside it their distribution, as Sir Joseph Hooker points out, is contrasted. *C. gigantea* reaches eastwards to China, while *C. procera* extends westwards and reaches the Cape de Verd Islands. The present notice deals with the former species, though most of what is to be stated would apply equally to the latter.

It is an erect spreading perennial bush which chiefly frequents waste lands in the warm moist tracts of most tropical countries, in India being especially abundant in Bengal, Assam, South India, and distributed to Ceylon, Singapore, the Malay Peninsula, and China. Both the species are known by the following names :— *Madár* (sometimes written by Europeans as *mudar* or even *muder*), *ák*, *ákanda*, *árka*, *yercum*, &c.

One of the earliest European writers to describe this plant was Prosper Alpinus (*De Plant. Ægypti, 1592, Ch. XXV.*). He tells us that it is the *beidelsar* of Alexandria, where it grows in damp places. Rheede was the earliest Indian botanist to narrate its properties (*Hort. Mal. 1679, II., t. 31*), and he furnished a most accurate drawing of the plant. He calls it *ericu*. Rumphius (*Hort. Amb. 1755, VII., t. 14, f. 1*) gives a poor illustration, but describes the plant in great detail under the name of *mador*. Sir W. Jones (*As. Res. IV. 1798, p. 267*) describes it under the name *arca*. Roxburgh placed it in the genus *Asclepias*, and Robert Brown, a little later, assigned to it a separate position under *Calotropis*. It is a sacred plant with certain Hindus, and is associated with the observances of the *maruts* or winds, the demigods of *Rudra*. The ancient Arabs also appear to have had superstitious beliefs regarding it, since they associated it with sun-worship. It is the *ushar* of the Arabs and the *khark* of the Persians, but the former seems to be a generic word for milk-yielding plants, and was probably restricted to *Calotropis* at a comparatively late date. Abu Hanifeh was perhaps the first Arab writer to give an explicit account of it, but much useful information will be found in the writings of Ebn Baithar (*Transl. by Southeimer, II. 193*).

This plant may be said to yield GUTTA-PERCHA from the milky sap ; a strong FIBRE from the bark ; a useful FLOSS from the seeds ; and a MEDICINE from the root-bark. Space cannot, however, be afforded to do more than review even these properties very briefly, and there are many minor ones.

M.S. del, J.N.Fitch lith.

Vincent Brooks, Day & Son Imp.

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The Gutta-Percha.

The inspissated and sun-dried sap (milk) drawn from the stems constitutes the *madar gutta* often mentioned by writers on India. It is, in fact, the most hopeful of the many gutta-yielding plants that do not belong to *Sapotaceæ*, the family which affords the true gutta-percha of commerce. There are large tracts of the sandy deserts of Rajputana and Central India, as also of Sind, in which this plant is not only the most prevalent but almost the only form of vegetation met with. In many instances also it has been observed to be the pioneer in the reclamation of sterile tracts. If, therefore, a demand could be originated for any one or all collectively of the products of this plant, much good might result to India. Its production could be fostered, and by selection and cultivation the quality and quantity of the produce improved, until the plant assumed the condition of a regular crop for poor soils. But unless some method could be designed for extracting the milk from shoots cut on account of their fibre, it is feared that it would not pay to tap this plant specially for its gutta. The stems and twigs are too small, and the yield from each too little, to justify the opinion that methodic tapping would prove remunerative as an industry by itself. Moreover, it has been found by chemical experiments that Calotropis gutta, being a fairly good conductor of electricity, is not suited for electrical purposes, and is thus very possibly debarred from one of the most profitable markets for this class of product.

Bark Fibre.

The bast fibre has attracted considerable attention and been spoken of as one of the best of Indian fibres. The great difficulty appears to consist in the inability to separate it rapidly and cheaply. Unfortunately the fibre cannot be prepared by retting the stems, since it is reported to rot when so treated, and yet the cleaned fibre when made into fishing lines and nets (as is the case in Karachi) seems quite durable and very strong, especially when used in sea-water. Mr. Liotard, after many experiments performed in Calcutta with fibre-extracting machinery generally, arrived at the unfortunate conclusion that the hopes formerly entertained by himself and others regarding this particular fibre were never likely to be realised:—1st, because of the small percentage of fibre (1·56) to weight of stems, and 2nd, the shortness of the ultimate fibre. But in recent experiments conducted at the Imperial Institute with a sample procured from Madras, Professor Wyndham R. Dunstan found that the staple measured fully 12 inches (*Agri., Ledger No. 2 of 1899, p. 3*). Charles Richards Dodge (*Useful Fibre Plants of the World, 104*) says that an acre of ground planted 4 by 4 feet with this plant will yield 10 tons of green stems and 582 lbs. of fibre; this would mean a yield of roughly 2·6 per cent. He then adds that the fibre possesses many of the qualities of flax, though somewhat finer. Its fineness, tenacity, lustre, and softness in fact fit it for many industrial purposes. Cross and Bevan found that when nitrated it could hardly be distinguished from silk, and long years ago Wight showed that a rope of this fibre broke with a

weight of 407 lbs., when a similar rope of cotton gave way with 346 lbs., and coir with 224 lbs. It is, however, quite incorrect to affirm, as has been done by Wiesner (*Rohst. d. Pflanz. Rch. II. 317*), Dodge, and others, that this fibre is widely used in India. Although prepared to a small extent by certain persons for very special purposes, the greatest possible difficulty was experienced in procuring the few pounds required by the Imperial Institute for the experiment just mentioned.

Mr. G. W. Strettell (*New Source of Revenue to India*) advocates the value of this plant as a paper material. It may thus be fittingly concluded that, were it found possible to utilize the gutta as an additional source of revenue, the fibre, either for textile purposes or paper-making, might, in spite of all that has been said to the contrary, prove worthy of special consideration. (*The Agri. Ledger No. 2 of 1899*).

Floss.

The coma of hairs or floss from the seeds constitutes one of the so-called vegetable silks or silk-cottons. This was chemically examined by Mr. Cross (*see The Agri. Ledger No. 17 of 1897, p. 3*) and found to possess an abnormally high percentage of furfurol. It was further believed to give evidence of being unsuited for some of the purposes of the textile industries. In practical experiments it has been found that the staple was too short and too light for existing machinery, the latter property allowing the fibre to be blown away. It is, however, a soft, very white floss, with a beautiful silky gloss, has been repeatedly spun experimentally in Europe, and the textile produced much admired. Reporting on a sample of the floss submitted to him by the Imperial Institute, in 1897, Mr. C. E. Collyer observed that some years previously the floss had been in demand for fancy textile purposes, but that it had dropped out of use owing to the difficulties arising from variation in the quality of the parcels sent and the intermittency of the supply when requirements arose. He thought that the trade might be revived if a moderate but continuous supply could be guaranteed. Good quality floss might realise 4*d.* to 5*d.* per lb. The pods and seeds should be removed, but the floss left in its natural condition, unopened and discoloured portions removed. Notwithstanding all this, no progress has been made in the utilization of the fibre. In India it is largely employed for stuffing quilts, its lightness being of great advantage, and in upholstery it holds a recognised position, since pillows and cushions stuffed with it are held to be very cool and refreshing. It is also, to some extent, regularly spun and made into fishing lines and nets.

Such then is all that can be said of the utilization of this floss at the present day. But there would appear to be little doubt that a few centuries ago this fibre was regularly spun and woven into some of the most beautiful textiles for which India was then famed. Human labour was of much less value than at the present time. Modern advances, coupled with the import of cheap European goods, seem to have destroyed the old industry. It would appear fairly certain that the *madar* floss was the "grass," the "cloth of herbes," "herba," &c., of early European travellers and

traders in Bengal, more especially Orissa. Further, that the traffic they allude to gave to the English language the expression "Grass-cloth," which later on became associated with a textile derived from China. Thus Cæsar Frederike (1563–7) speaks of "Cloth of herbes,"—"a kind of silke which groweth amongst the woodes without any labour of man. And when the bole thereof is growen round as bigge as an orenge, then they take care onely to gather them." Rhea never could have been found as a wild plant in Orissa, and the allusion to the "bole" or fruit, from which the fibre was obtained, precludes rhea from consideration altogether. The passage most unquestionably denotes *Calotropis gigantea*. This view is confirmed by Fitch (1585) who gave an account of his explorations of the Ganges, including Orissa (Orixa as he calls it) where there was "great store of the cloth which is made from the Grasse which they call *yerua*." That vernacular name is clearly a form of the word that denotes *Calotropis* throughout Orissa and the Carnatic to this day. Doubtless, also, Linschoten's "Herbe Bengalen" was the same textile. I have purposely made reference to Linschoten, under *Bœhmeria nivea*, because all modern writers, whom I have been able to consult, quote the above passages, and several others to the same effect under *Rhea*, in place of *Calotropis*, to which they most undoubtedly belong. Coming to more recent dates, Capt. A. Hamilton (*New Account of E. Indies, pub. 1744*) who, in 1627, visited Bengal, and passed up the Ganges to Benares and Patna, describes Balasore as producing manufactures of cotton, silk, mixed silk and cotton, and of "*herba* (a sort of tough grass) of which they make *ghighams*, *pinaseos*, and several other goods for exportation." Even so late as 1813 Milburn mentions, among his Bengal piece goods, "herba taffaties."

Though it is certainly most surprising that this ancient industry in silk-cotton textiles should have died out completely, and been all but forgotten, it is a useful object lesson of the possibilities of the future, which manufacturers would do well to consider.

Medicine.

It would take many pages to indicate even a tithe of the information that exists on the varied medicinal properties of the milk, the flowers, the leaves, and the root-bark. The late Dr. Kanny Lall Dey, C.I.E., regarded *madar* as a useful medicine when given during remission of intermittent fevers, and especially if these were associated with eczema. The majority of Indian medical writers extol the merits of the root-bark in the treatment of dysentery. In order to verify these opinions, the study of *madar* was taken up by the Central Indigenous Drugs Committee of India. Authentic parcels of the root-bark were procured and made up in the form of both a powder and liquid extract. These preparations were issued to a selected number of Hospitals and Dispensaries throughout India, with the suggestion that they should be used as alteratives and alterative tonics. By chemical tests it had been previously ascertained that the bark of mature plants was preferable to that of immature ones, since they contained a higher percentage of the acid and bitter resinous matter on which the property depended. As a substitute for ipecacuanha

it is not so satisfactory as its reputation would seem to imply. In fact, in acute dysentery and chronic diarrhœa, it is found undesirable, and certainly less efficacious than ipecacuanha. When given in large doses it frequently occasioned nausea and vomiting, so persistent and severe as to make the drug objectionable if not dangerous. In small doses of, say, 3 to 5 grains of the powder (preferably), its action on the stomach was that of a mild stimulant, hence the opinion was often expressed that it might, with advantage be combined with *cinchona* in the treatment of certain fevers. As an emetic the powder, in doses of 30 to 40 grains, was found very effectual.

GEORGE WATT.

III.—BOTANIC GARDEN, DURBAN.

Under the skilful administration of the Director, Mr. John Medley Wood, A.L.S., the Botanic Garden, Durban, or, as it was formerly called, the "Natal Botanic Gardens," has achieved much for the material and scientific interests of the Colony. Mr. Wood was appointed in March, 1882.

On the 28th May, 1883, Dr. Sutherland, the Surveyor-General, addressed to the Natal Government an interesting report on the history and state of the Garden at the time. This is a historical document of considerable interest, which it is desirable to reproduce for convenience of reference, as it is apparently not otherwise accessible.

THE SURVEYOR-GENERAL TO COLONIAL SECRETARY.

28th May, 1883.

The Botanic Garden at Durban took its rise from a grant of 50 acres of ground that was made to the Trustees of the Natal Agricultural and Horticultural Society from the town lands of Durban about 30 years ago. A subsidy of £50 a year was granted them in aid of the Society out of Colonial revenue. From time to time that subsidy was increased proportionate to the increase of the revenue until now it stands at £350. The Society was established with the view to the promotion of various agricultural industries, and the subsidy was granted with the same object. At the outset the public rendered considerable support to the Society, and evinced great interest in the efforts that were put forth by the Trustees and the Curator. The latter opened connections with kindred institutions in various British Colonies, and especially with the Royal Gardens, Kew. Seeds of our Colonial flora were collected, and live plants in Wardian cases were sent in exchange for seeds and plants believed to be suitable for industrial or ornamental purposes. The annual reports exhibited a large array of exotics under cultivation, some of which give promise of great utility, and as fast as plants were sufficiently grown for distribution, they were caught up with avidity and soon took firm hold in the Colony.

Plantains, Bananas, Pine Apples, and fruit trees in great variety were thus plentifully disseminated.

The Aloe (*Agave vivipara*), yielding the valuable sisal hemp of commerce [an unfortunate error], and the "Rhea," yielding the China grass, the Jute plant, and the Manila hemp, the Cocoa Nut, and the Screw Pine, and many other plants, were introduced, many of which also took firm hold, while others, such as the Cocoa Nut, proved almost complete failures.

Cinchona, as represented by various species, and almost every known plant yielding rubber or gutta-percha, have been tried again and again, with scarce any prospects of success.

Public interest began to flag when it was found that further additions ceased to be made to the catalogue of useful plants. The apparent necessity for public support was gradually becoming less through the increase of the Government subsidy. At this juncture public support was the more urgent on account of the indications that were revealed by experience of the comparative unsuitableness of the soil for the experimental culture of plants, for which even the climate of this Colony may not be adapted.

The Botanic Garden at Durban is on the lower slope of the Berea. The lowest portion of the ground is composed of white sand, impregnated with traces of undecayed mould, derived from the disintegration of various species of rush, dwarf *Cyperus*, and grass, which occupy the swampy hollows of the sandy plain on which Durban stands at an average level, above the sea, of about 20 feet. With the ascent of the Berea to the uttermost limits of the 50 acre plot, at an elevation of about 120 feet, the soil changes into a fine sand, coloured dark red by peroxide of iron. After one or two crops, of almost any kind, this soil becomes exhausted, so that only trees of vigorous growth, and far searching roots, continue to thrive in it, and being very loose, open, and without clay, the effects of manure soon pass off. I make these observations in extenuation of the little success that has attended the strenuous efforts of the various Curators, who were placed in the Garden under the control of the Trustees. The reports sent in, from year to year, during that long period, and which have been published in the Government Gazette for general information, contain extensive schedules of the plants in the Garden, upon which considerable labour was bestowed. In many instances there were losses owing to the tentative or experimental nature of the Curator's work. But these very losses were not without profit, for the reason that the public were thus prevented throwing away any of their efforts in the same direction.

In the endeavour to show what has been done in South Africa, by the introduction of important members of the Flora of other countries, it may be stated that, in 1834, there were but three individual trees of *Eucalyptus* at the Cape of Good Hope. In 1846, soon after the present Government took possession of this Colony, Mr. Joseph Dicks, of the Settlement of Howick, brought a large assortment of Acacias and Gums both from the Cape of Good Hope and from Australia. These were speedily distributed, and fresh additions were made by Mr. Dicks, and many others following his praiseworthy example. In a few years the growth of these exotics became a prominent feature in the Colony. Every farm had its plantation, which embraced numerous species of

valuable timber trees of the coniferous order. On Mr. Corduke's estate, at the Settlement of York, there are many hundreds, if not thousands, of indigenous and exotic trees yielding valuable timber.

The exertions, later on, of Messrs. Phipps, Blackbarrow, Topham, Wilkinson, Todd, Risley, Pepworth, Smith, Baynes, Sutton, Henderson, and many others, in the extension of forest plantations, have resulted in the occupation of tracts of land with forest growth far in excess of the denudation, or deforestation, of natural forests caused by the demand for timber for purposes of Colonial industry. The artificial forests thus created have great advantage in their greater accessibily than the natural forests, the latter, as a rule, being on rugged mountain slopes, with a West or South Western exposure. The growth, also, of timber in the planted forests is considerably in excess of that in the natural. One acre of land, suitable for the gums or wattles will, in ten years, yield close upon two hundred tons of timber. In little more than half the same period *Pinus insignis* has been known to attain a diameter at the butt of fully a foot, and a height of 50 feet. Gums and Acacias, with a little care at the outset, have been known to drain most thoroughly swamp land, the only mode of escape for the lodgment of water being the foliage of the plantation.

Several professional nurserymen are in full employment near the City of Pietermaritzburg, at elevations of 2000 to 3000 feet above the sea level. The tree and plant lists produced by these men, showing what they have for sale, would be creditable to Colonies of a century's growth. Moreover, the Botanic Society of Pietermaritzburg, and its grounds near the City, may take rank in the growth and diffusion of highly useful and ornamental trees.

With the exception of the experimental efforts applied in the Gardens at Durban, all that has hitherto been done has been directly useful as supplying a great colonial necessity. No doubt many will soon begin to ramify into researches, when there will be no little share of doubt, and, perhaps, loss. Already considerable advance has been made in tea plantations, [Introduced from Kew. See *Kew Bulletin*, 1887, September, p. 12] which have succeeded in producing a good and marketable article, notwithstanding that our climate does not bear comparison with that of China or India. That the interest which should be taken in Botanical Enterprise in this Colony is not what it should be, for the benefit of Colonists themselves, there is no room for doubt, but, at the same time, there is proof of some interest in the operations of the several nurserymen now fairly established in the Colony, and in the annual reports of the Botanic Societies of Durban and Pietermaritzburg, of the Horticultural Society of Pietermaritzburg, and of various Agricultural Societies throughout the Colony, all of which are liberally subsidised by grants from the Colonial revenue, and maintained by the contributions of individual members. No small share of interest has been shown in Botanical Enterprise in the enactment of rigorous laws and the issue of Proclamations from time to time, when there was danger of the introduction of diseases, by means of imported plants, which might severely affect the prospects of the planters.

When doubts arose touching the safety of imported plants, and their immunity from disease, steps were immediately taken for the protection of the Colony, even if they involved the destruction of the plants in question.

The interest of the Government has further been evinced by the appointment of a Commission to enquire into the condition of the natural forests. The Report of that Commission has, for some time, been under the consideration of the Legislature, with the view, probably, to the creation of a Department of Forestry.

(Signed) P. C. SUTHERLAND,
Surveyor General.

IV.—MISCELLANEOUS NOTES.

Visitors during 1899.—The number of persons who visited the Royal Botanic Gardens during the year 1899 was 1,197,565; that for 1898 was 1,277,215. The average for 1889–98 was 1,448,604. The total number on Sundays was 503,089, and on week-days 694,476. The maximum number on any one day was 59,561 on August 7, and the smallest 50 on December 5.

The detailed monthly returns are given below :—

January	17,377
February	21,020
March	48,789
April	116,405
May...	153,327
June	192,941
July	208,880
August	264,175
September	111,633
October	33,413
November	19,317
December	10,288

Mr. JAMES MCLENNAN PURVES, a member of the gardening staff of the Royal Botanic Gardens, has been appointed, on the recommendation of Kew, by the Secretary of State for Foreign Affairs, Forester in the British Central Africa Protectorate.

Mr. STANLEY ARDEN, a member of the gardening staff of the Royal Botanic Gardens, has been appointed, on the recommendation of Kew, by the Secretary of State for the Colonies, Superintendent of Experimental Plantations in the Federated Malay States.

Mr. Isaac Henry Burkill, M.A., F.L.S., a Principal Assistant in the Royal Botanic Gardens, has been appointed, on the recommendation of Kew, by the Secretary of State for India in Council, Assistant Reporter on Economic Products to the Government of India.

Adrien René Franchet. — By the sudden death of this botanist on February 14, 1900, France has lost her most eminent and most indefatigable phytographer, and the students of the botany of Eastern Asia, more especially, one of the most amiable and the most honourable of fellow-workers. A. R. Franchet was in his sixty-sixth year, and the last twenty-five years of his life were principally devoted to the study of the flora of China and Japan, beginning with the *Enumeratio Plantarum in Japonia sponte Crescentium* (1875–9), which he compiled in conjunction with Dr. L. Savatier, who resided in Japan for some years. One of the merits of the *Enumeratio* for botanical and horticultural purposes consists in the references to the illustrations in the Japanese classical works *Honzo Zufu*, *Somoku Zusetsu*, and *Kwa-wi*. Dr. Savatier had previously published a translation of the letterpress of the *Kwa-wi*, but the figures have not been reproduced. The earliest contribution to botanical literature by Mr. Franchet that has come under our notice is the foundation of *Bruniera* in 1864 (*Billotia*, i., p. 25, t. 1) on *Lemna arrhiza*, L., but he had been anticipated by Horkel and Schleiden in regarding it as generically distinct. Among his other early papers were several on the genus *Verbascum*, including a descriptive monograph of the Central European species. But his *Flore de Loir-et-Cher* (1885) is his most important contribution to European botany, being a fully descriptive, historical, and geographical account of the plants of the Department. In the midst of his Chinese labours, Franchet found time to elaborate the plants collected by the "Mission Révoil" in Somaliland, 1882; the plants of the "Mission Capus" in Turkestan (*Ann. Sc. Nat.*, 1883–4); and the flowering plants of the French "Mission Scientifique du Cape Horn," 1882–3. Returning to the botany of Eastern Asia, it may be safely asserted that since the death of C. J. Maximowicz there was no botanist who could pretend to possess the same critical and detailed knowledge of the plants of that region as the late A. R. Franchet. The titles to his various contributions would fill a page of the *Bulletin*. They are scattered in a number of periodicals and Societies' publications, but most of them were issued separately as well, and some of them are beautifully illustrated, especially those that originally appeared in the *Nouvelles Archives du Muséum d'Histoire Naturelle de Paris*. Among the latter are :—*Plantæ Davidianæ* (the separate publication forming two volumes quarto); *Monographie du Genre Chrysosplenium*; and *Les Carex de l'Asie Orientale* Of the *Plantæ Delavayanæ*, an independent octavo illustrated work, only three parts appeared, the last in 1890. Altogether Franchet described at least 1100 new Chinese species, besides a considerable number of new genera. Prominent among the genera, of which he described many new species, are :—*Carex*, *Gentiana*, *Lilium*,

Primula, *Quercus*, *Rhododendron*, *Saussurea*, and *Senecio*. His last paper, "Sur les *Swertia* et quelques autres *Gentianées* de la Chine" (*Bulletin de la Société Botanique de la France*, *Fev.*, *1900*), has reached Kew since his death.

Mr. Franchet held no lucrative post; no professorship. He was for many years attached as botanist to the Muséum d'Histoire Naturelle, of Paris, but received the very smallest pittance for his services. This may account for his having accomplished so much work. He seems to have been universally respected and esteemed; was for many years an active member of the Botanical Society of France, and President of that body in 1898. Only last year he was elected Foreign Member of the Linnean Society of London. *Franchetia*, Baill. (Cunoniæ), a native of Madagascar, and *Franchetella*, Pierre (Sapotaceæ), named in memory of the deceased, are not represented by authenticated specimens in the Kew Herbarium. Kew, where Franchet worked most assiduously one fortnight, in 1894, has lost in him a most obliging and disinterested correspondent.

Dr. A. Ernst.—The *Botanisches Centralblatt*, lxxxi, p. 256 (Feb. 7, 1900), announces the death of Dr. A. Ernst, who was for many years Professor of Natural History in the University, and Director of the National Museum at Caracas, Venezuela. Dr. Ernst corresponded with Kew and contributed to the collections, chiefly to the economic side. His time, apart from teaching, was principally devoted to the investigation of the vegetable productions of Venezuela, both of wild and cultivated plants, and to the diseases of plants, especially those due to, or accompanied by, fungus parasites. One of his earliest contributions (*Journal of Botany*, 1865, pp. 143, 277, 306) is on the plants used medicinally at Caracas, Venezuela, and their vernacular names. This was followed by many others of a similar character, and of great service, on account of the association of the scientific and vernacular names. A more compendious work is the volume compiled by Dr. Ernst on the National Exhibition of Venezuela, in 1883. It contains much useful information on the natural productions—animal, vegetable, and mineral—of the country. As it is a book not found in many of the libraries of this country, it may be useful to give the title: *La Exposicion Nacional de Venezuela en* 1883, *Obra escrita de orden del Ilustre Americano, General Guzman Blanco, por A. Ernst. Publicacion del Ministerio del Fomento.* Caracas. Imprenta de "La Opinion Nacional," 1884.

He also wrote reports on the participation of Venezuela in the exhibitions at Vienna, in 1873, and Philadelphia, in 1876.

Presentations to the Library during 1899.—The second part of Messrs. Wood and Evans's work—*Descriptions and Figures of Natal Indigenous Plants* (See *Kew Bulletin*, 1898, p. 206), has

been received. Amongst the fifty plates included in this part are three of new species, namely :—*Oncinotis inandensis*, *Moraea glauca* and *Chlorophytum Haygarthii*. From the author, Prof. A. Gravis, of Liége, has been received an elaborate quarto work entitled : *Recherches anatomiques et physiologiques sur le Tradescantia virginica, L.* ; also *Archives de l'Institut Botanique de l'Université de Liége*, vol. 1. From Mr. T. Husnot, the final part of his work on the Gramineae, which includes descriptions and figures of the indigenous and cultivated grasses of France, Belgium, Britain, and Switzerland. Dr. J. P. Lotsy has sent a copy of *Mededeelingen van de Laboratoria der Gouvernement's Kinaonderneming*, No. 1, containing his work—*De Localisatie van het Alcaloid in Cinchona Calisaya ledgeriana en in Cinchona succirubra*. An interesting volume entitled : *Textrinum Antiquorum, an account of the Art of Weaving among the Ancients*, by James Yates, London, 1843, has been received from R. B. Prosser, Esq. Amongst other presentations may be mentioned Mr. A. Jaczewski's *Monographie du genre Sphaeronema, Fries*, from the author ; *Transactions of the Jenner Institute of Preventive Medicine*, second series, from the Council ; *Icones Selectae Horti Thenensis*, from Mr. van den Bossche ; *Die Entwickelung der Pflanzengeographie in den letzten hundert Jahren*, from the author, Prof. A. Engler ; *Tentamen Florae Rossiae Orientalis*, by Mr. S. J. Korshinsky, from the Imperial Academy of Sciences, St. Petersburg. In addition to the above is the continuation of about 20 serial publications presented by the Bentham Trustees.

Plants presented to the Herbarium during 1899. — Five fascicles of excellent specimens of Hieracia, from France and Spain, distributed by Messrs. G. Arvet-Touvet and G. Gautier. Dr. F. Arnold has sent the continuation of his Lichenes Exsiccati. A set of Sieber's plants, collected on his "Iter alpinum delpinense," from Dr. J. Briquet. Austrian "Kryptogamae Exsiccatae," Century IV, from Dr. A. Zahlbruckner. "Flora Exsiccata Austro-Hungarica," Centuries 23–32, from Professor Ritter von Wettstein. A further collection from the Yatung Valley, Tibet, has been received from Commissioner H. Edgar Hobson, and Dr. Sven Hedin's plants, also from Tibet, from Professor F. W. C. Areschoug. The chief Chinese collection received was a set of Oaks from Shensi, presented by Dr. E. Baroni, of Florence. Indian and Malayan plants have been contributed by Dr. D. Prain, J. F. Duthie, Esq., H. N. Ridley, Esq., Dr. Treub, and C. Curtis, Esq., and numerous specimens, frequently of his new species, from British New Guinea, and Queensland, by F. Manson Bailey, Esq. J. H. Maiden, Esq., and R. T. Baker, Esq., have sent new or rare plants from New South Wales, and Maurice Holtze, Esq., of Adelaide, a set of Mr. Max Koch's plants from the Mount Lyndhurst District, South Australia. Two small collections from the neighbourhood of Albany, Western Australia, have been received from Sergeant B. T. Goadby. Amongst the African collections received is one made by Captain M. S. Wellby, during his travels in Southern Abyssinia, several small ones from K. J. Cameron, Esq., made at Namasi, British Central Africa, and Captain E. J.

Lugard's, from the Kwebe Hills, Ngamiland. Dr. L. Pierre has contributed a number of specimens of critical species from Western Tropical Africa. A collection, consisting chiefly of ferns, from Zanzibar Island, has been received from J. T. Last, Esq., and Madagascar plants from W. Warpur, Esq. Contributors of South African plants include Major A. H. Wolley Dod, from whom upwards of 1300 named specimens have been received; Professor P. MacOwan, E. E. Galpin, Esq., H. Bolus, Esq., and J. Medley Wood, Esq., who has sent chiefly Grasses and Cyperaceæ from Natal. Professor W. G. Farlow has presented 42 Cryptogams, chiefly American, new to the Kew Herbarium. J. Macoun, Esq. continues to send collections from Canada and the islands of the Behring Sea. Specimens from Iowa, Nebraska, South Dakota, and Wyoming, have been sent by Professor Pammel, from the Bahamas, by Mrs. Northrop, from Jamaica, by W. Fawcett, Esq., from Mexico, by Mr. Michele, and from British Guiana, by G. S. Jenman, Esq. C. B. Clarke, Esq. has presented Dr. Ule's Cyperaceæ, from Brazil, and Mr. C. Lindman's Cyperaceæ, from Brazil and Paraguay; Dr. Briquet a set of Reineck and Czermak's Central Brazilian plants; Dr. Fischer von Waldheim, petaloid Monocotyledons and Cyperaceæ, collected chiefly by Riedel, in Brazil, and Mr. P. Dusén, of Stockholm, a collection from Temperate South America. Exceedingly interesting specimens of South American high-level plants have been communicated by Edward Whymper, Esq., Sir W. Martin Conway, and E. A. FitzGerald, Esq.

James Edward Winterbottom's Himalayan and Tibetan Herbarium.—The appearance in the *Geographical Journal* (1900, pp. 150–170, and 243–264, with a map) of the narrative of a journey to the lakes Rakas-tal and Manasarowar in Western Tibet, undertaken in September, 1848, by a survivor (Lieut.-General Sir R. Strachey), more than fifty years after the event, is an extraordinarily belated publication, yet none the less interesting. Captain Richard Strachey, of that date, was accompanied on the journey in question by Mr. J. E. Winterbottom, and, among other results, was an excellent collection of dried plants from a region previously unknown. It is referred to in Hooker and Thomson's *Flora Indica*, Introductory Essay, p. 66, as the most valuable for its size that had ever been distributed from India, and as comprising 2,000 species. The Hookerian Herbarium contains a set of these plants, which were worked out and distributed by Strachey and Winterbottom themselves before the end of the year 1853. A catalogue of the plants was printed at the same time, constituting pages 63–122 of volume ii. of a projected work that was never published. An abstract of the Tibetan portion of this catalogue is incorporated in a paper (*Journ. Linn. Soc.* xxx. (1894), p. 125) by Mr. W. B. Hemsley, "On two small Collections of Tibetan Plants." The complete catalogue, it may be added, was published in E. I. Atkinson's *Economic Products of the North-West Provinces*, pp. 403–670 (1876).

After completing the arrangements of their joint collections, J. E. Winterbottom went to Egypt. This was in January, 1854; and subsequently, on his way to Constantinople, he was seized

with diarrhœa and was put on shore at Rhodes, where he died on July 4, 1854. From that time till the beginning of the present year, his own set of dried plants had lain by untouched. Then the collection came into the possession of Mrs. Pain and Mrs. Gnosspelius, cousins of the deceased, who offered to present it to Kew, an offer which was gladly accepted, because it not only supplements the Kew set, but also contains Winterbottom's original notes. Fortunately, the specimens are no worse for their fifty years' seclusion.

Herbarium Petiverianum.—It is pretty well known that Petiver's *Herbarium proprium* is in the Sloane Collection at the British Museum; but Mr. J. G. Luehmann, the Curator of the National Herbarium at Melbourne, recently discovered in the Sonder Collections there a small number of specimens which he correctly surmised to be of the same origin. He sent them to Kew, and they have been compared with, and found to correspond with those in the British Museum. Some of them have been returned to Melbourne, and the others retained at Kew. They are highly interesting as samples of one of the earliest English herbaria, and also as examples of neatness of labelling. These particular specimens are described in the *Philosophical Transactions* of the Royal Society of London, between 1700 and 1703.

Flora Capensis.—The final part of Volume VII. has been issued, with the following preface to the whole volume by the Director :—

It was considered advisable to commence the continuation of the *Flora Capensis* with Volume VI., which was almost exclusively devoted to the orders which furnish what are familiarly known as "Cape Bulbs." These are perhaps now more largely cultivated in Europe than any other South African plants, and a systematic description of the species it was felt would meet a long-acknowledged want.

Several considerations suggested the desirability of next attacking the seventh and concluding volume of the work in advance of the fourth and fifth, which are still unpublished. What perhaps more weighed with me is the fact that the orders contained in it admittedly present more difficulties than are likely to be encountered in any other part of the work. It has, however, been my good fortune to be able to enlist the aid of contributors who, in each case, have had the advantage of a special previous study of the groups they have undertaken.

Amongst these I must enumerate :—Arthur Bennett, Esq., F.L.S., who has particularly devoted his attention to the *Naiadaceæ*; Dr. Masters, F.R.S., who is an acknowledged authority on the *Restiaceæ*; C. B. Clarke, Esq., F.R.S., who has long been occupied with a comprehensive memoir on the *Cyperaceæ*; and finally Dr. Stapf, A.L.S., who had previously collaborated with Sir Joseph Hooker in preparing the *Gramineæ* for the Flora of British India. The latter order occupies more than half the volume, and this portion of it at least will, I trust, be found of especial usefulness in a country which is largely pastoral.

For the limits of the regions under which the localities in which the species have been found to occur are cited, reference may be made to the preface to Volume VI.

I have again to acknowledge the assistance I have received from Mr. C. H. Wright, A.L.S., and Mr. N. E. Brown, A.L.S., Assistants in the Herbarium of the Royal Botanic Gardens, the former in reading the proofs, and the latter in working out the geographical distribution.

Besides the maps already cited in the preface to Volume VI., the following have also been used :—

Natal. By Alexander Mair, 1875.

Kaffraria und die östlichen Grenz-Distrikte die Cap-Kolonie. By H. C. Schunke in Dr. A. Petermann's Mitteilungen, 1885, t. 9.

Spezial-Karte von Afrika. Gotha : Justus Perthes, 1893.

To the South African correspondents enumerated in the preface to Volume VI., I have again to tender my acknowledgments for the contribution of specimens.

I must further record my obligations to others, and especially to those whose aid in various ways has been of the greatest value in the preparation of the volume :—

Dr. Wilhelm Brehmer, of Lübeck, has lent the study set of Drège's *Restiaceæ* and *Gramineæ*, without which it would have been impossible to arrive at a correct knowledge of some of the species.

Dr. A. Fischer von Waldheim, Director of the Imperial Botanic Gardens, St. Petersburg, has lent the specimens of *Danthonia* and *Pentaschistis* collected by Ecklon and Zeyher.

Dr. Theodor Magnus Fries, Professor of Botany in the University of Upsala, has lent Thunberg's collection of grasses, which have afforded valuable help in the correct identification of some of the species of the earlier authors.

Leo Hartley Grindon, Esq., has contributed a small collection from the Orange Free State.

Professor Eduard Hackel, of St. Pölten, Austria, has kindly lent some type-specimens of grasses.

Major Wolley Dod, R.A., has contributed a very large collection of plants made by himself in the Cape Peninsula, which is unexpectedly rich in new species.

It only remains again to add that the expense of preparation and publication of the present volume has been aided by grants from the Governments of Cape Colony and Natal.

W. T. T. D.

Kew, March, 1900.

List of published names of plants introduced to cultivation : 1876-1896.—This has been issued as *Additional Series*, Vol. IV., of the *Kew Bulletin*. The following preface by the Director explains the history and object of the work :—

The activity of private cultivators and nurserymen is continually enriching our gardens with plants which are either new to cultivation or have been reintroduced after being lost sight of.

Every corner of the world, which affords any prospect of rewarding a collector, is systematically searched. It would be difficult to estimate the expenditure of money and labour upon this kind of enterprise, which has not seldom been attended with the sacrifice of life.

Unfortunately its results are too often launched upon commerce or otherwise distributed under names which have either been inaccurately determined or are purely fanciful. These names cannot be wholly disregarded, inasmuch as they become current in horticultural literature. It constantly, therefore, becomes necessary to trace them to their earliest publication in order to obtain information as to the native country of the plants to which they belong and other particulars relating to them. The task is, however, by no means an easy one, as the notices have to be sought in numerous and widely-scattered horticultural periodicals.

To obviate this difficulty a list of new garden plants was published in the *Gardeners' Year Book and Almanack* as long ago as 1860, and this list was continued annually until the *Year Book and Almanack* of 1886, which contained the new plants of 1885. The new plants of 1886 to October were published by instalments in the columns of the *Journal of Horticulture* during the months of January to May, 1887. The publication was not continued in the following year, and it was believed that it was no longer likely to be undertaken by private enterprise. Such an annual list was, however, found to be so indispensable, even for the work of Kew itself, that it was decided to undertake its compilation by the Kew Staff. Accordingly the list for 1887 was published in the *Kew Bulletin* for 1888. It was accompanied by the following prefatory remark :—

"As the publication of a list of new garden plants is of the "greatest interest to botanical establishments everywhere, and as "such a list would give information respecting many new plants "grown at Kew, and distributed, in course of exchanges, to "correspondents in all parts of the world, it has been determined "to continue the list as one of the regular issues of the *Kew* "*Bulletin*. It is believed that such a publication will be of "service to the horticultural world generally."

This expectation has been amply fulfilled, and the publication of the lists has been continued annually. From 1890 this has been done in the form of an appendix to the *Bulletin*. Several correspondents at Kew have found it convenient to cut up the lists and post up their contents in the form of a continuous alphabetical catalogue. It is obvious that, for the purpose of running down a name, a search through a long series of annual lists becomes increasingly tedious. It was therefore felt that it would be a boon to others besides Kew to combine the lists for, at any rate, a considerable period in one volume.

The Kew Library contains copies of the lists published in the *Gardeners' Year Book* for the years 1862 to 1878 and 1880 to 1886. Every effort has been made to obtain a copy of that for 1879, but without success. The only one known to exist (apart from public libraries) is that in the possession of the proprietors of the *Journal of Horticulture*, and this has been most obligingly lent to Kew for transcription.

The new plants of 1876 to 1885 were catalogued for the *Gardeners' Year Book* by Mr. N. E. Brown, A.L.S., an Assistant in the Herbarium of the Royal Botanic Gardens—as unofficial work. He proceeded on a definite plan which has been continued since. It was therefore considered advisable in preparing the present list to start with the new plants of 1876.

The lists published in the *Kew Bulletin* are now prepared as routine work by the Staff.

In addition to species and well-marked varieties, hybrids, whether introduced or of garden origin, have been included where they have been described with formal botanical names. Mere cultural forms of well-known garden plants are omitted for obvious reasons.

In every case the plant is cited under its published name. These are largely provisional and often wildly incorrect. When first introduced into cultivation the merit of many new garden plants depends solely on their foliage. Their true botanical affinities cannot be ascertained till they flower, and in some cases many years may elapse before this takes place. A striking instance is afforded by *Talisia Princeps*, now known to belong to Sapindaceæ ; it had previously passed in gardens under the names of *Theophrasta pinnata* (Myrsinaceæ) and *Brownea Princeps* and *B. erecta* (Leguminosæ).

Where definite botanical determinations are possible, or synonymous names exist, these are given in square brackets. Only names are cited which agree in form, at any rate, with the usual Latin binominal nomenclature. The personal authority for such names has, however, been uniformly omitted, as it was found in too many cases impossible to assign it with certainty.

The reference given is to the publication in which the plant is first described or figured ; to this is added, when available, a reference which supplies further information. The natural order is given in the case of the first species cited of each genus. This is followed by abbreviations intended to indicate the appropriate cultural conditions. A brief notice of the habit and most striking points of each plant is given ; but it has not been considered necessary to attempt botanical descriptions. But a description of hybrids of garden origin and of mere garden varieties is not given, as otherwise the list would exceed the limits within which it is necessary to confine it. The native country is added at the end.

The total number of plants catalogued for the 21 years, which is covered, amounts to 7,600. The majority of the actually new plants included have been derived from the United States of Colombia, the Malayan Region, and the Polynesian Islands, all areas known to be rich in species and still imperfectly explored botanically.

The orders most largely represented are all Monocotyledonous ; they are *Orchidaceæ*, *Liliaceæ*, and *Araceæ*. This is, however, only significant as representing the present drift of horticultural taste. The two first are especially popular in the British Isles for the sake of their flowers, and the latter on the Continent for their foliage.

The genera most largely represented are the following :—

Odontoglossum	about 350	entries.	
Cypripedium	„ 350	„	
Cattleya	„ 250	„	
Dendrobium	„ 220	„	
Lælia	„ 160	„	
Masdevallia	„ 150	„	
Oncidium	„ 120	„	
Croton, Iris	„ 100	„	each.

With regard to *Odontoglossum* a great number of forms and even of species previously undescribed have been introduced from the high Andes. Our knowledge of the genus has been, in fact, about doubled during the period covered by the list. None of the forms enumerated in the list has originated in cultivation.

The art of the gardener has added to botanical science the knowledge of a considerable number of bigeneric hybrids, *i.e.*, of crosses between species belonging to distinct and even not very closely allied genera. It was at one time supposed that such crosses were either impossible, or, if possible, were a proof that the genera were not really distinct. Darwin had long, however, clearly shown that the limitations and possibilities of cross-fertilisation do not run parallel with taxonomic affinities, *i.e.*, with the place occupied by the parents in a natural classification. It may be convenient to give the following list of bigeneric hybrids included in the list :—

Aloe × Gasteria.
Aphelandra × Stenandrium.
Bertolonia × Sonerila.
Calanthe × Limatodes.
Chionodoxa × Scilla.
Epilælia = Epidendrum × Lælia.
Epiphronitis = Epidendrum × Sophronitis.
Gloxinia × Tapeinotes.
Lælio-cattleya = Lælia × Cattleya.
Phaio-calanthe = Phaius × Calanthe.
Sophro-cattleya = Sophronitis × Cattleya.
Sophro-lælia = Sophronitis × Lælia.
Spiræa × Astilbe.
Urceocharis = Urceolina × Eucharis.
Zygocolax = Zygopetalum × Lycaste.

An even more remarkable phenomenon is presented by the at present unique case of a trigeneric hybrid :—*Sophro-cattleya Veitchii*, a garden hybrid between *Lælio-cattleya elegans* and *Sophronitis grandiflora*.

The number of names enumerated under *Croton* largely represents mere forms cultivated for the beauty of their foliage of *Codiæum variegatum*, formerly known as *Croton pictus*. In point of fact the two genera are widely distinct, and belong to two different groups of Euphorbiaceæ.

The publications from which the list has been compiled, with the abbreviations used to indicate them, are as follows :—

Acta Hort. Petrop.—Acta Horti Petropolitani.
American Florist.
B.H.—La Belgique Horticole.
B. M.—Botanical Magazine.
B. T. O.—Bulletino della Società Toscana di Orticoltura.
Bull Cat.—W. Bull, Catalogue of New, Beautiful, and Rare Plants.
Bull. Mus. Paris.—Bulletin du Muséum d'Histoire Naturelle, Paris.
Cat. Comp. Cont. d'Hort.—Catalogue de la Compagnie Continentale d'Horticulture.
Cat. Nat. Arb. Zösch.—Catalogue des National-Arboretums zu Zöschen.
Damm. Cat.—Dammann, General Price List and Catalogue of Bulbs.
Engros-Cat. des Nat. Arb. Zösch.—Engros-Catalogue des National-Arboretums zu Zöschen.
Fl. and P.—Florist and Pomologist.
Fl. des S.—Flore des Serres.
F. M.—Floral Magazine.
G. and F.—Garden and Forest.
Gard.—The Garden.
Gard. World.—Gardening World.
Garten-Zeitung.
G. C.—Gardeners' Chronicle.
Gfl.—Gartenflora.
G. M.—Gardeners' Magazine.
H. G.—Hamburger Garten- und Blumenzeitung.
Icones Plantarum.—Hooker's Icones Plantarum.
Ill. H.—L'Illustration Horticole.
Jard.—Le Jardin.
J. H. F.—Journal de la Société Nationale d'Horticulture de France.
J. O.—Journal des Orchidées.
J. of H.—Journal of Horticulture.
Journ. Bot.—The Journal of Botany.
Journ. de Bot.—Journal de Botanique.
Journ. Linn. Soc.—Journal of the Linnean Society.
J. R. H. S.—Journal of the Royal Horticultural Society.
K. B.—Kew Bulletin.
L.—Lindenia.
Lemoine Cat.—Lemoine, Catalogue et Prix-courant.
L'Hort. Int. Cat.—L'Horticulture Internationale, Catalogue.
Lind. Cat.—Linden, Catalogue des Plantes.
M. D. G.—Mitteilungen der Deutschen Dendrologischen Gesellschaft.
M. G. Z.—Möller's Deutsche Garten-Zeitung.
M. K.—Monatschrift für Kakteenkunde.
Nat. Arb. Zösch.—Neuheiten-Offerte des Nationale-Arboretums zu Zöschen.
N. B.—Notizblatt der Königl. Botanischen Gartens und Museums zu Berlin.

N. G. M.—Dr. Neubert's Garten-Magazin.
O.—L'Orchidophile.
Oester. Bot. Zeitschrift.—Oesterreichische botanische Zeitschrift.
O. R.—Orchid Review.
Proc. R. H. S.—Proceedings of the Royal Horticultural Society.
R.—Reichenbachia.
Regel, Descr.—Regel, Descriptiones Plantarum.
R. H.—Revue Horticole.
R. H. B.—Revue de l'Horticulture Belge.
Sand. Cat.—Sander's Catalogues.
Späth Cat.—Späth's General Nursery Catalogue.
Veitch Cat.—Veitch's Catalogue of Plants.
Veitch Man.—Veitch's Manual of Orchidaceous Plants (*Cattl.*—Cattleya and Lælia; *Cypr.*—Cypripedium; *Dendr.*—Dendrobium; *Masdev*—Masdevallia).
Ver. Zool.-Bot. Ges. Wien.—Verhandlungen der Kaiserlich-Königlichen Zoologisch-botanischen Gesellschaft in Wien.
Vilmorin Cat.—Catalogues de Vilmorin-Andrieux et Cie.
Warner Orchid. Plants.—Warner, Select Orchidaceous Plants.
W. G.—Wiener Illustrirte Garten-Zeitung.
Williams' Cat.—Williams' Descriptive Catalogue.
W. O. A.—Warner and Williams' Orchid Album.
W. O. Gr. Man.—Warner and Williams' Greenhouse Manual.
Year-book.—Hogg's Gardeners' Year Book.

Other abbreviations used are :—

diam.—diameter.
f., ff.—figure, figures.
fl.—flower or flowers.
fr.—fruit.
ft.—foot or feet.
G.—Greenhouse.
H.—Hardy.
herb.—herbaceous.
H. H.—Half-hardy.
in.—inch or inches.
infl.—inflorescence.
l—leaf or leaves.
per.—perennial.
pet.—petal or petals.
pl.—plate or plates.
S.—Stove.
sep.—sepal or sepals.
ser.—series.
shr.—shrub.
syn.—synonym.
t., tt.—plate, plates.
var.—variety or varieties.

It only remains to add, that the present list has no pretensions to be more than a compilation. As an Index to the horticultural literature of recent years, it is believed that it will be found of practical utility. To have attempted to further elaborate it or to give it anything approaching a scientific character would have postponed its publication indefinitely.

No doubt, its use will detect some errors. For example, by some mischance the genus *Sonerila* has got out of place. But those who in using the book discover its defects will probably be those who will regard them most leniently.

W. T. THISELTON-DYER.

January, 1900.

The Cyperaceæ of the West Indies.—The first fasciculus of the second volume of Dr. I. Urban's *Symbolæ Antillanæ seu Fundamenta Floræ Indiæ Occidentalis* contains a very full synonymic and descriptive monograph of the whole of the known West Indian Cyperaceæ, elaborated by Mr. C. B. Clarke, F.R.S., &c., from the collections at Kew, supplemented by those at the British Museum, Berlin, Paris, &c., including the types of many imperfectly-known species from the most remote sources. Although very full synonymy is given, Mr. Clarke does not, he informs us, profess to have absolutely exhausted even the West Indian synonymy of some of the species enumerated. The total number of species described is 241, ranged under twenty-six genera. Only five species are here described for the first time; and it may be said generally of the Cyperaceæ that there are exceedingly few local species out of the total of about 3,250 in all parts of the world, and that a large number of species have a wide geographical range. The most remarkable fact that has come out in this enumeration is the large number of species common to West tropical Africa and the West Indies. This feature is also common to the mainland of America and Africa, and prominent in this connection is the almost equal distribution of the species of the distinct genus *Mapania*, section *Eumapania*, in Guiana and Guinea. With regard to generic limits, Mr. Clarke has not departed much from Bentham and Hooker's *Genera Plantarum*, except in *Cyperus*, which he divides into *Pycreus*, *Juncellus*, *Cyperus*, *Mariscus*, and *Torulinum*; and here he only restores generic rank.

Scientific Papers by the Staff.—Dr. D. H. Scott in his third paper, "On the Structure and Affinities of the Fossil Plants of the Palaeozoic Rocks" (*Phil. Trans. Royal Soc.* 191, pp. 81–126) describes the stem and roots of a fossil fern-like plant—*Medullosa anglica*—from the coal measures of Lancashire. *Medullosa* is a genus of the *Cycado-filices*—a group owing that name to the combination of characters which they possessed. Dr. Scott's new species has a special interest, for it is more ancient geologically than any other *Medullosa*; it is more completely preserved, and more simple in structure. Moreover, it is the only form as yet formed in Britain.

Mr. H. H. W. Pearson in his paper on "The Botany of the Ceylon Patanas" (*Journ. Linn. Soc.*, xxxiv., pp. 300–366) gives an account of investigations made during a visit to Ceylon in 1897 upon the vegetation of the grass lands of the Central Plateau of the island. These grass-lands are the so-called patanas, and lie between 2,000 and 8,000 feet. The native graziers find in them a pasturage for their cattle, and once or twice each year, before the burst of the monsoon, cause the blackening of miles of country by firing the coarse wiry herbage to procure a fresh bite. As each recurring fire burns the edge of the forest, adding a little to the grass land, these patanas appear to be the work of centuries of repeated conflagration. The natural forest of Central Ceylon above 4,500 feet is a 'wet forest,' that below 4,500 a 'Savannah forest.' Changed to grass land the 'wet forest' becomes a 'wet moor,' and natural reafforestation remains possible when

the land is adequately protected from fire. This is not the case below 4,500 feet; for here the strongly-contrasted wet and dry periods have so acted that with the destruction of the forest there has gone on such a complete removal of the surface soil that natural reafforestation is no longer possible.

The paper closes with some account of the biologic characters of the vegetation and a list of the species which comprise it.

Messrs. I. H. Burkill and C. H. Wright in their paper, "On some African Labiatæ with alternate Leaves" (*Journ. Linn. Soc.*, xxxiv., pp. 268–276) call attention to several interesting specimens belonging to this order which have been received at the Royal Gardens from tropical Africa. Except as an obvious abnormality, Labiatæ with alternate leaves were unknown until two years ago, when a French botanist, Monsieur H. Hua, detected one in a plant which he named *Icomum paradoxum*. To the genus *Icomum* are now added three other species, all from British Central Africa, and alternation of the leaves is shown also to occur in a member of the genus *Plectranthus* from Angola.

Metford's Lemon.—The large fruits of this striking *Citrus* have attracted much attention in the Mexican House at Kew. The following article, which is reproduced from the Gardener's Chronicle for April 28, 1900, p. 267 (see also May 5, p. 288), gives an account of its history :—

In January, 1896, Miss Laura Metford Badcock, Fons George, Taunton, forwarded to Kew a lemon fruit which had been grown in the garden of Mrs. Tucker at Leigh Court, Angers Leigh, Wellington, Somerset. Miss Badcock wrote :—"The history of the big lemon is this : the original plant was grown from seed by my great aunt, Miss Metford, at Hook House, Taunton, in the very early years of this century, and was kept there till 1868, when the place was sold at my grandfather's death, and the plant given to a friend, who let it die. The present and only plant was grown from a cutting of that tree given by my grandfather, Dr. Metford, to Mrs. Tucker, and now owned by Miss Tucker, who sometimes gives us a lemon from it. I will ask her to forward a few cuttings from the tree to you. My people were so proud of this tree that I should be glad if you could name it 'Metford's Lemon.' Shortly afterwards, Miss Tucker, when forwarding two cuttings from her tree, wrote : 'It had so many fruits in the past two years that it has not thrown much young wood. For want of space it had to be pruned.'"

The Kew plant is about 10 feet high, and it bears only two fruits, which are each 8 inches long and 6 inches wide. The leaves are equally large for a lemon, being 8 inches by 4 inches; the flowers are white, tinged with rose. Botanically, the plant is undoubtedly a form of the true lemon, *Citrus Medica* var. *limonum*, but we have not been able to find any form exactly answering to it among the many described and figured in botanical works. The nearest is one figured in Dr. Bonavia's illustrated work on the Citrus family in India, under the name of "Kumaon" or "Gulgul" lemon, which he calls the "elephant" variety of the lemon group. That, however, differs

from Metford's lemon in its smaller fruits ($13\frac{1}{4}$ inches in girth), the roughness and wartiness of the rind, the "bronzy reddish-brown" colour of the flowers, and the wingless leaf-stalks.

When recommending the better sorts of oranges and lemons for cultivation in India, Dr. Bonavia says, "Lahore should give attention to the large sour and juicy lemon known in the Punjáb as 'Gulgul.'" In this connection we may mention that Mr. George Monro, of Covent Garden, to whom the fruit sent to Kew by Miss Badcock was forwarded for his opinion as to its usefulness commercially, considered it much too large to find a ready market.

The plant grows very freely when grafted on the pumelo, as may be seen by the size and vigour of the Kew specimen, which is only four years old.

As some experts who have seen the plant at Kew have called it a pumelo, and others a large orange, it may be worth while to state what are, according to Sir Joseph Hooker, the distinguishing characters of the three species into which the useful members of the genus Citrus group themselves:—*C. Medica* (including citrons, lemons, sour and sweet limes), young shoots, glabrous, purple; flowers more or less pink. *C. Aurantium* (comprising sweet, bitter, or Seville and Bermagotte oranges), young shoots glabrous, greenish-white; flowers pure white. *C. decumana* (represented by the shaddock, pumelo, grape-fruit, forbidden fruit), young shoots pubescent; flowers white. *W. W.*

Indian Rice or **Water Oats** (*Zizania aquatica*).—Two years ago a few small living plants of this ornamental annual grass were sent to Kew by Mr. Jackson Dawson, of the Arnold Aboretum. Some two or three of these succeeded, and from seed ripened by them some large clumps have been made, and during the past season have attracted a good deal of attention. The most luxuriant growth was produced in the new Water Lily Pond (south of the river end of the Lake); here plants attained a height of nearly 12 ft., with inflorescences more than 2 ft. 6in. in length.

In the Pond, near the Palm House, transplanted seedlings reached 10 ft. in height. Probably when self-sown seedlings develop, without check, this height may be exceeded.

Zizania aquatica is a native of North America, where it occurs in marshes and ponds and along the swampy borders of streams, from Florida northwards, being especially common all round the Great Lakes. In *Minnesota Plant Life* it is stated to be of importance as an economic plant among the aborigines of the State. The Chippewas call it *manomin* and gather it in the autumn of the year for food. The grain is longer and thinner than the rice of the Orient, but when boiled is quite as agreeable to the taste as the cultivated form. The Indians collect it in September, beating it into their canoes, and after harvesting, it is winnowed by hand. It was cultivated, upwards of a century ago, by Sir Joseph Banks, at Spring Grove, near Hounslow. Apparently the seeds lose their vitality if once allowed to become quite dry, and this must explain the failure to germinate them in this country, when sent by post, or otherwise, *in a dry state;* they should be sent either in water or mud.

Nelumbium speciosum in Egypt.—From the most reliable sources of information it appears that this plant was introduced into Egypt, from India, about 500 B.C., and disappeared, probably, in the tenth century of the Christian era. But there exists some doubt concerning its disappearance, because a passage in Savary's *Lettres sur l'Egypte* (1778), though somewhat vague, hardly admits of any other construction than that Savary saw the rivers near Damietta covered with this majestic flower. Sir George Birdwood sent seeds of it to Kew last November, with the information that his son has re-discovered the plant growing wild in the Desert Provinces of Egypt, and had since cultivated it in the public garden laid out by him in Cairo. Two photographic views of the plant growing in the Cairo garden accompanied the seeds. Mr. Birdwood describes the flowers as white and orange, by which he means, probably, that the petals are white and the anthers orange. This variety is by no means so common as the pink one, supposed to be the one formerly known in Egypt. Roxburgh describes this variety (*Flora Indica*, ii, p. 647) and there is a coloured figure of it in the Roxburgh collection of drawings. Roxburgh states that he had observed both the pink and white varieties on the coast of Coromandel, and Sir Henry Collett informs us that he has met with the white one in Manipur.

Landolphia Perieri.—The following information supplements that upon Madagascar india-rubber in a recent number of the *Bulletin* (1899, pp. 35–39). It is borrowed from three communications by M. Henri Jumelle, the first to the Académie des Sciences, Paris (*Comptes-rendus*, cxxix., pp. 349–351), the others to the *Revue des Cultures Coloniales* (v., pp. 104–109 and 154, 155).

Landolphia Perieri is a rather slender liane of the forests in Madagascar lying between the watershed and the north-west coast. Its stem attains 6 inches in thickness, but slowly, and the majority of stems met with are much smaller. The natives who apply the names of 'Piralahy' and 'Vahealahy' to the plant, make rubber from it by cutting these stems into lengths, collecting the latex which drips from the ends and coagulating it with lemon juice or with bruised fruits of the tamarind. The latex is very thin and watery, so that a whole day's work results in but a little more than a pound of rubber selling on the spot at $6\frac{3}{4}d.$–$9d.$ The small return for the labour has caused the collectors to forsake their occupation for gold-mining.

M. Jumelle notes that better preparation would ensure a better price. Coagulated by being boiled or allowed to dry, the rubber is dark and of poor quality (cf. *K.B.*, 1892, p. 70); but a number of reagents precipitate a pinky-white caoutchouc. These reagents are notably acids—sulphuric, acetic, or citric—or salts; amongst the latter are common salt and Chili saltpetre.

It has not been customary for the Sakalavas to interfere with the root; and after the stem has been cut to the soil a number of shoots spring up which in two to three years may possibly be ready to cut again.

Brazilian Stink-Grass.—A grass sent under this name to the Botanic Gardens, Sydney, and recommended, from the repute it has in Brazil, for cultivation in Australia, proves to be *Melinis minutiflora*, Beauv.

This species is common in Brazil, where it is said rapidly to take possession of land newly cleared of forest. In Africa it is found from the south of the Sahara to Natal, and it occurs in Madagascar. Its Portuguese names in Brazil 'Capim mellado' and 'Capim gordura' mean honey-grass and fat-grass, and there horses and cattle greedily seek it and fatten; but, adds St. Hilaire (*Aperçu d'un voyage dans l'intèrieur du Brésil*, p. 8), they acquire little vigour. Gardner's testimony is to the same effect, and Doell (in Martius, *Flora Brasiliensis*, ii., pt. 2, p. 242) repeats the statement, adding that possibly the deciduous spikelets are the cause. This is in agreement with the statement contained in the report by H.M.'s Consul-General at Rio, that "it can be cut for green or dry fodder, but, if so treated, this must be done before the seed-heads show themselves."

In the coffee-growing districts of Brazil, Capim mellado is often sown in order to stifle certain weeds; so thickly does it mat on the surface that the most stubborn of them—*Anatherum bicorne*—is ousted (*see* Van Delden Laërne, Brazil and Java; Reports on Coffee-culture, London, 1885, p. 26).

How it grows in these districts Sir Charles Bunbury has described (Botanical Fragments, London, 1883, p. 103). "There are two plants," he writes, "which by their extraordinary abundance, and by the way in which they domineer over the rest of the vegetation, cannot fail to force themselves on one's attention. One is the large Brake (*Pteris arachnoidea*, Kaulf.); the other a small grass—Capim mellado. The herbage of the latter is thickly clothed with soft clammy hairs giving a greyish tinge to the green; the flowers, by their enormous abundance at the time of which I speak, gave a reddish hue to the whole surface of the lower hills. The way in which this grass covers the ground continuously for leagues together, to the exclusion of everything else, is very extraordinary. Auguste de St. Hilaire gives a curious account of the way in which it invaded the Province of Minas, spreading farther and farther wherever the woods were cut down and burned, and smothering all the smaller and weaker plants till it reigned alone over extensive tracts. I saw little of it in the 'natural' campos to the south of Ouro Preto; it seemed (as St. Hilaire remarked) to establish itself only where the soil had been stripped of its previous clothing of wood."

Two forms, differing in the colour of the spikelets and in duration, are said to exist; of these that with violet is preferred to that with pallid spikelets. The violet form, in fact, replaces the pallid when the two are sown together.

Pandanus Fruit used as a scrubbing brush.—While travelling in Burma Surgeon-General Bidie noticed in several bazaars an article, which was evidently a fruit split in halves, being sold as a scrubbing brush. It was of an oblong shape, some 4 or 5 inches

long, flat on the split side and convex on the natural surface, and armed with stout bristles sufficiently strong to remove paint and tar from wood, &c., with wonderful celerity. "Local inquiries," Dr. Bidie wrote, "failed to get any information as to its source, and it was, therefore, sent to Kew, where the Director at once identified it, and finally informed me that it is the fruit of a species of *Pandanus*, probably *foetidus*, with the cellular tissue removed by maceration. Subsequently, a sample of the fruit was sent to Mr. T. Christy, who reports that he thinks he can make valuable commercial use of it, provided he can only get it in quantity and in good case."

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